

REMARKS

This responds to the Office Action mailed on April 20, 2007.

Claims 1, 3-13 and 23-33 are now pending in this application.

§102 Rejection of the Claims

Claims 1, 3, 4, 11 and 12 were rejected under 35 USC § 102(e) as being anticipated by Wachtler et al. (U.S. 6,274,391). The Applicant respectfully traverses the rejection and requests the Office to consider the following.

The Office Action has asserted the adhesive taught by Wachtler is attached to the recess bottom surface:

Although it is conceded that Wachtler et al. discloses that the semiconductor device is attached directly to the substrate as argued, it is noted that Wachtler et al., in subsequent paragraphs after the portion cited by applicant, further clarifies that the device is attached by using an adhesive [column 8, lines 53-57].

The question is not *whether* Wachtler uses adhesive, but *where* the adhesive is located. The only teaching by Wachtler as to where, is in the gap: “adhesive material may or may not fill the gap between the edge of the semiconductor device 16 and the cavity 14”. (Wachtler et al. at col. 8, lines 60-61). The only positive recitation of adhesive location in the gap, coupled with Wachtler’s unmistakable teaching of “attached directly” leaves us with no teaching that the adhesive is on the recess bottom surface.

The Office Action makes a leap of logic that by virtue of the word adhesive meaning gluing, we know *where* Wachtler applies his adhesive, i.e. on the recess bottom surface:

In addition, it is noted that the Merriam-Webster’s Collegiate Dictionary 10th ed. defines the term “attach” as “to make fast as by tying or GLUING” [emphasis added]. In

But again, *whether* Wachtler optionally uses adhesive is not an issue, but *where* the adhesive is located is the issue.

The Office Action again repeats an incorrect assertion that Wachtler nowhere teaches the drawings are to scale:

With regards to the drawings, it is noted that nowhere in the disclosure Wachtler discloses that the drawings are to scale. The court has held that when the reference does not disclose that the drawings are to scale and is silent as to dimensions, arguments based on measurement of the drawing features are of little value. *Hockerson-Halberstadt, Inc v. Avia Group Int'l*, 222 F.3d 951,956, 55 USPQ2d 1487, 1491 (Fed. Cir. 2000). However, the description of the article pictured can be relied on, in combination with the drawings, for what they would reasonably teach one of ordinary skill in the art. *In re Wright*, 569 F.2d 1124, 193 USPQ 332 (CCPA 1977). As stated

But the Office has avoided and not dealt with Applicant's insistence, that where Wachtler calls out "not to scale" only with respect to FIG. 18, the implication for all other figures is that they are to scale. Absent Wachtler having a global disclaimer of "not to scale" and in the presence of Wachtler's single disclaimer for a single figure (FIG. 18), as "not to scale", the implication favors the interpretation that all other drawings are to scale.

The Office cites to another decision:

1491 (Fed. Cir. 2000). However, the description of the article pictured can be relied on, in combination with the drawings, for what they would reasonably teach one of ordinary skill in the art. *In re Wright*, 569 F.2d 1124, 193 USPQ 332 (CCPA 1977). As stated

But the Office has ignored the plain teaching of Wachtler with his "description of the article[s] pictured", since he takes measures only to point out FIG. 18 "not to scale", but leaves us with no teaching regarding all the other figures. What reasonably teaches one of ordinary skill in the art, therefore, is his drawings, save FIG. 18 are to scale.

The Office asserts that it is common practice not to show the adhesive in figures:

Finally, one of ordinary skill in the art recognizes that it is a common practice in the art to not show the adhesive in the figures. For example, Figure 4 in Cheng et al. (US 2003/0134455 A1) discloses a device (210) attached to substrate (208) without

But the Office is diverting attention away from what Wachtler teaches in particular, such that what is "common practice" is germane only in the absence of adequate teachings by Wachtler. Applicant respectfully requests a citation to an authority that it is "common practice" etc. In any

event, since Wachtler has specific teachings that may not amount to the bare assertions by the Office of what “common practice” is or is not, Wachtler’s teachings must first be relied upon before making an assumption of what is common practice.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." (*Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987), M.P.E.P. §2131, 8th Ed., Rev. 4).

Claim 1 has the limitation of

a thermally conductive material adhering said at least one
microelectronic die back surface to said recess bottom surface.

The Office Action erroneously states that Wachtler et al. “teaches a microelectronic package comprising: ... a thermally conductive material (adhesive) adhering said at least one microelectronic die back surface to said recess bottom surface (see col. 8, lines 55-57)”

The Office Action adds the following assertions:

(1) “Wachtler teaches that the semiconductor device (16) is secured within cavity (14) of substrate (12) by adhesive means [col. 8, lines 54-55].” Applicant does not dispute this, rather, that Wachtler does not teach the limitation of claim 1, “adhering said at least one microelectronic die back surface to said recess bottom surface”.

(2) “Wachtler further clarifies that his adhesive is formed into said cavity before said semiconductor device is placed in the cavity [col. 13, lines 63-65].” Applicant traverses this teaching as non-enabling and further as inoperative according to 35 USC 101. Claim 6 (col. 13, lines 63-65) depends from claim 5, which has the extreme limitation of “the dimensions of said cavity match the dimensions of the semiconductor device.” (Claim 5). But claim 1 has already restricted the structure to require the “thin film overlay on said surface of said semiconductor device and on a surface of said substrate adjacent and substantially parallel with said surface of said semiconductor device ...” (Claim 1). Consequently, any adhesive first placed into the cavity (Claim 6) renders the above limitation of claim 1 impossible, and therefore inoperative. There is no teaching in the body of the specification to resolve this inoperative teaching in claims 5 and 6.

(3) The Office Action quotes from an external source (Merriam-Webster's Collegiate Dictionary 10th Ed.) to attempt to heal the lack of teaching in Wachtler commensurate with claim 1. But it is inappropriate to proffer extrinsic evidence, particularly when intrinsic evidence teaches to the contrary of the specification. Phillips v. AWH Corp., 376 F.3d 1382 (Fed. Cir. July 21, 2004, cited in MPEP 2111.01). Phillips also settles the issue that the specification is always highly relevant to claim construction and is the single best guide to the meaning of a claim term in dispute. Phillips also settles the issue that it is appropriate to rely heavily on the written description for guidance as to the meaning of the claims. Consequently, where Wachtler teaches at least five reasons why no adhesive is applied to the back of the die 16 (as articulated previously by Applicant, and as repeated below), the Wachtler does not anticipate claim 1.

(4) The Office Action states “it is noted that nowhere in the disclosure Wachtler discloses that the drawings are to scale.” Applicant respectfully but strenuously disagrees. Wachtler only disclaims as “not to scale” with respect to FIG. 18. Consequently, where Wachtler only disclaimed one figure is as “not to scale”, the implication for all other figures is that they are to scale. Absent Wachtler having a global disclaimer of “not to scale” and in the presence of Wachtler's single disclaimer for a single figure (FIG. 18), as “not to scale”, the implication favors the interpretation that all other drawings are to scale.

(5) “[A]pplicant is implying that Wachtler fails to teach a thermally conductive adhesive material.” Applicant did not imply as much. What Wachtler teaches is that “[i]f adhesive material is used” (Wachtler at column 8, line 56), which implies it may not be used. But Wachtler, who is vitally interested to “optimize heat dissipation” (Wachtler at column 2, line 26), teaches that “[i]f adhesive material is used, the die attach material may ... be ... thermally non-conductive.” (Wachtler at column 8, lines 56-57). Thus, adhesive material may not be used, but if it is, it may be thermally non-conductive, which would destroy Wachtler's invention if attached to the back of the die 16.

The ***Response to Arguments***, proffered in the Final Office Action, states that “Wachtler et al. clearly teaches that the die is attached to the bottom surface of the recess (14).” (Final Office Action at page 3). Applicant respectfully disagrees.

Wachtler provides at least five teachings that lead away from what is claimed.

First, Wachtler teaches that the “primary thermal path for the semiconductor device 16 is to the air which is very short because the semiconductor device is attached directly to the substrate or packaging 12”. (Wachtler at column 8, lines 18 et seq). “Attached directly” implies nothing is therebetween. Second, Wachtler, who is vitally interested to “optimize heat dissipation” (Wachtler at column 2, line 26), teaches that “[i]f adhesive material is used, the die attach material may ... be ... thermally non-conductive.” (Wachtler at column 8, lines 56-57). Thus, adhesive material may not be used, but if it is, it may be thermally non-conductive. This teaching militates further away from inserting the adhesive between the die 16 and the substrate 12, but not in the gaps as he teaches. Third, Wachtler states and illustrates, and Wachtler only teaches that the “adhesive material may or may not fill the gap between the edge of the semiconductor device 16 and the cavity 14”. (Wachtler et al. at col. 8, lines 60-61). This, accompanied with his teaching of “if adhesive material is used” (*supra*), further militates against teaching what is claimed. The Final Office Action states that “the figures of Wachtler et al. are not drawn to scale.” (Final Office Action at page 3). But the only reference Wachtler makes for “not to scale” is with respect to FIG. 18, not the junction of items 12 and 16. Fourth, Wachtler illustrates no space for an adhesive between structure 18 and structure 16 at the backside surface thereof. And fifth, Wachtler teaches that the “surface of semiconductive device 16 opposite cavity 14 should contain the bond pads of the die and be flush with the surface of the substrate 12” (Wachtler at column 8, lines 64 et seq). This indicates an adhesive therebetween would make a “flush” match of surfaces difficult.

Wachtler therefore fails to teach what is claimed regarding “a thermally conductive material *adhering* said at least one microelectronic die *back surface* to said recess *bottom surface*”. (Claim 1, emphases added). Because “[t]he identical invention [is not] shown in as complete detail as is contained in the ... claim” (*Richardson, supra*), Wachtler et al. does not anticipate claim 1. Withdrawal of the rejections is respectfully requested.

§103 Rejection of the Claims

Claim 6 was rejected under 35 USC § 103(a) as being unpatentable over Wachtler et al. in view of Shibamoto et al. (U.S. 6,563,212). Applicant respectfully traverses the rejection and requests the Office to consider the following.

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). (M.P.E.P. § 2143 8th Ed, Rev.1).

Claim 6 depends from claim 1. Wachtler et al. only teaches that the “adhesive material may or may not fill the gap between the edge of the semiconductor device 16 and the cavity 14” (Wachtler et al. at col. 8, lines 60-61), and Wachtler et al. illustrates no space for an adhesive between structure 18 and structure 16 at the backside surface thereof. Thus, although Shibamoto may teach various adhesives, they cannot be located where claim 6 requires. Shibamoto has nothing to do with “a heat spreader having a first surface, said heat spreader having at least one recess defined therein by at least one sidewall extending from said heat spreader first surface to a recess bottom surface” (Claim 1, from which claim 6 depends). Withdrawal of the rejections is respectfully requested.

RESERVATION OF RIGHTS

In the interest of clarity and brevity, Applicant may not have addressed every assertion made in the Office Action. Applicant's silence regarding any such assertion does not constitute any admission or acquiescence. Applicant reserves all rights not exercised in connection with this response, such as the right to challenge or rebut any tacit or explicit characterization of any reference or of any of the present claims, the right to challenge or rebut any asserted factual or legal basis of any of the rejections, the right to swear behind any cited reference such as provided under 37 C.F.R. § 1.131 or otherwise, or the right to assert co-ownership of any cited reference. Applicant does not admit that any of the cited references or any other references of record are relevant to the present claims, or that they constitute prior art. To the extent that any rejection or assertion is based upon the Examiner's personal knowledge, rather than any objective evidence of record as manifested by a cited prior art reference, Applicant timely objects to such reliance on Official Notice, and reserves all rights to request that the Examiner provide a reference or affidavit in support of such assertion, as required by MPEP § 2144.03. Applicant reserves all rights to pursue any cancelled claims in a subsequent patent application claiming the benefit of priority of the present patent application, and to request rejoinder of any withdrawn claim, as required by MPEP § 821.04.

CONCLUSION


Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney at (801) 278-9171 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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